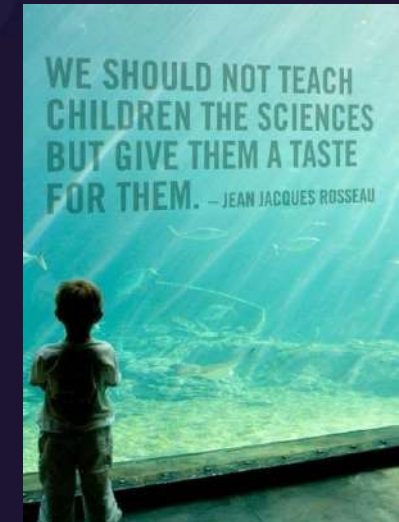
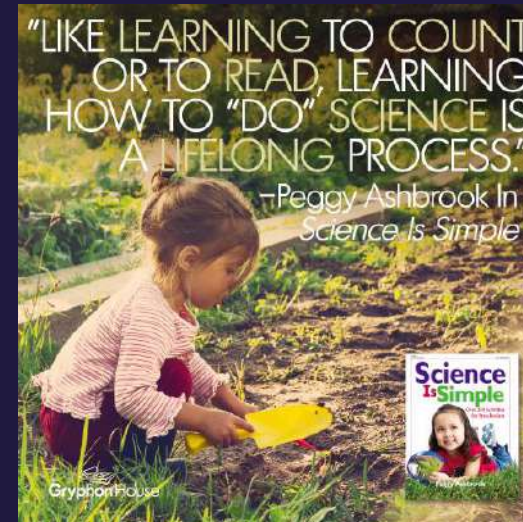
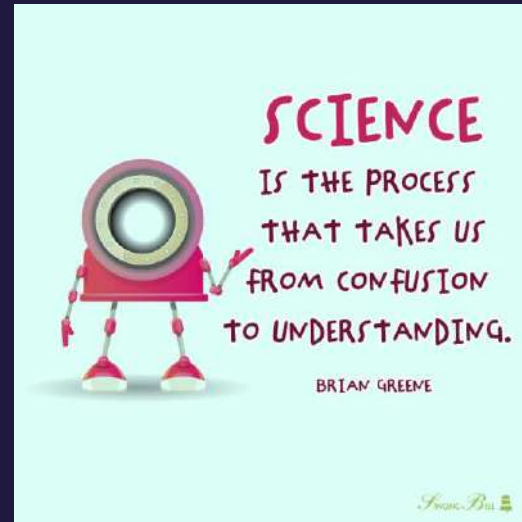
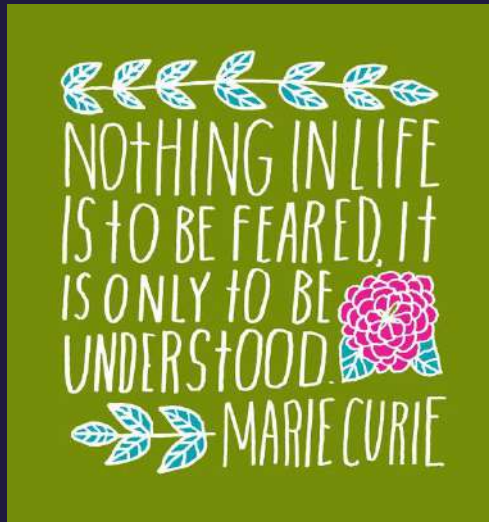




Science Portfolio





Curriculum overview:

Intent

At The Mease we believe that **all of our children can be great scientists!** Our intent is to provide all children with full access to a knowledge rich Science curriculum which provokes our children to ask big questions about the world around them, to have a natural curiosity that lasts a lifetime and to **develop the skills to work scientifically** to find answers and become **life-long learners**.

We encourage our children to immerse themselves in enquiry-based learning as well as **collaborating with others** through researching, investigating, presenting and evaluating their findings. This enquiry-based learning alongside our experience days, **promotes the importance of Science and how vital it is within the world's future** as well as ensuring our children are **resilient** learners. Our mission to make sure that our children have no limits when it comes to working within Science when they are older; we want them know that they can become astronauts, marine biologists, forensic scientists or even pyrotechnic engineers!

Using the national curriculum as our starting point we have designed The Mease Science curriculum to ensures our children have the **scientific knowledge and conceptual understanding** they require to progress onto their next stage of learning. Our children will be **excited and enthusiastic** to share their learning with others.





Curriculum overview:

Implementation

At The Mease Spencer Academy, our Science lessons are aligned with the National Curriculum and are taught weekly to allow time for children to delve deeply into each topic. The concepts within these topics are repeated throughout our Science curriculum so that new knowledge can build on prior knowledge in a clear and coherent way. Scientific skills are also taught in a progressive way and are used to underpin the children's understanding of each topic.

Our lesson structure is influenced by Alex Bedford and follows a mastery approach. Each lesson, the children are given an opportunity to; review and revisit; learn and explore new content through small steps; listen and engage in high quality modelling and undergo independent practice. Tasks are based on: robust assessment for learning; opportunities to be collaborative and activities which are hands-on and practical. Children are immersed in a vocabulary rich environment and are encouraged to use this when they conduct their own Scientific Enquiries.

Children access opportunities to be challenged in a variety of ways throughout each lesson by our mastery microphones and are scaffolded to succeed through adaptations to whole class learning opportunities, small group work and interventions if appropriate.

In Science, we take a practical and hands on approach to teaching so the children remember the awe and wonder they feel as they make new discoveries and perform experiments. Beyond our discreet lessons, we also have 'Opportunities to Explore' within our EYFS and Yr 1 classrooms which are continuous provision style activities set up to promote scientific exploration, curiosity and enquiry.

We revisit topics throughout each year through 'Flashback Fridays' and we use interleaving in order to 'interrupt the forgetting'/consolidate learning. Knowledge organisers are used at the beginning of each half term to define the knowledge that must be learned and to promote the retention of subject specific knowledge and vocabulary. At The Mease Spencer Academy, we are lucky to have a vast amount of industry surrounding us e.g. Toyota and Rolls Royce. We utilise this to build our children's Scientific cultural capital through Science weeks, events and





Curriculum overview:

Impact

Science progress at The Mease is measured through our children's ability to retain scientific knowledge so that they can remember more and explain more. Our consistent approach to Science teaching results in a deep understanding of core concepts, an ability to carry out scientific enquiries to understand the world they live in and finally, they are excited and enthusiastic about their learning.

In terms of assessment, children in EYFS are assessed through in the moment observations. In KS1 and KS2, children are assessed against the NC core objectives. In order to assess children's level of understanding, teachers carefully triangulate evidence of pupil learning. This evidence includes: targeted questioning, observations, teacher feedback and responses, marking, quizzes etc.

Our children will be aware of the possibilities for careers in Science, as a result of our community links and connection with national and local agencies such as the STEM association, Rolls Royce and Toyota. This will provide our children with access to positive role models within the field of science from the immediate and wider local community.





What a successful Scientist looks like:





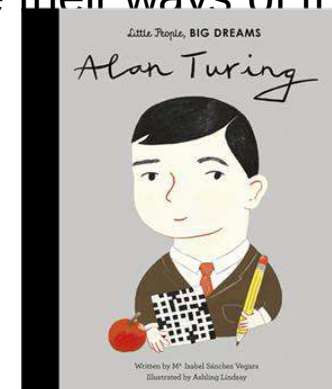
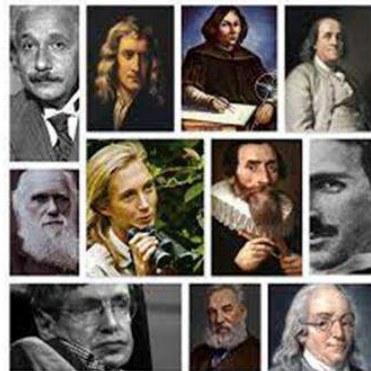
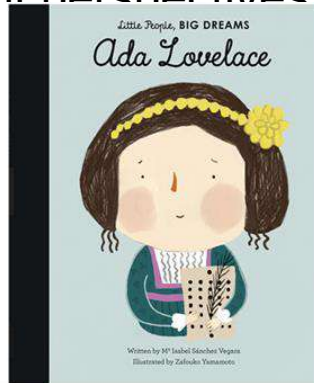
SMSC:

	<u>Spiritual development</u>	<u>Moral development:</u>	<u>Social development:</u>	<u>Cultural development</u>
Definition	Explore beliefs and experiences; respect values; discover oneself and the surrounding world; use imagination and creativity; reflect meaningfully on their own actions and the actions of others.	Recognise right and wrong; understand consequences; investigate moral and ethical issues, offer reasoned views.	Use social skills in different contexts; work well with others; resolve conflicts; understand how communities work.	Appreciate cultural influences; participate in culture opportunities; understand, accept, respect and celebrate diversity.
Examples of SMSC in Science	Sometimes science and spiritual ideas cause conflict but in a modern society it is important to understand why these conflicts arise so we can respect the views of others. Children are encouraged to question these conflicts both within RE and Science using their learnt knowledge. Often science is able to stand alongside the spiritual beliefs of many. This is looked at often from a neutral stand point within science lessons.	Our understanding of Science has allowed us to develop technology we couldn't have imagined 50 years ago. Now however, we must start deciding if we should we do all the scientific activities we are able to or morally should we decide not to. This can be as simple as should we test medicines for humans that could save lives on animals causing them cruelty? It could be as complex as should we allow somatic or germ line cell therapy. Moral development is a vital part of any scientist's development. Students will need to develop a good understanding of it to become a good rounded scientist.	Science is changing our society. The life expectancy is getting longer, people are driving more efficient and more eco-friendly cars, and more and more people are putting solar panels on their rooftops. Our society has become dependent on scientific developments which we could not have foreseen 50 years ago but also our lives are likely to change significantly in the future because of our reckless damaging activities to the environment as a human society. Students must consider their impact on the world around them and start to look at what we can do to help the next generation have a habitable planet. Areas we specifically focus on are that of pollution, global warming and destruction of the ozone layer.	Scientific development comes from all across the world, from people of all backgrounds and cultures. Some of science's most important discoveries have come from other parts of the world and it's important for students to understand this as many believe that progress comes largely from the UK or America. It is also important to understand how the different cultures around the world can have different impacts on the planet and what impact more economically developed countries have on poorer areas. This will also be vital into the future as we need to monitor the impact of quickly developing cultures around the world on our environment.



Equality and Diversity (including BV):

At The Mease we believe that it is important for all of our children to be inspired by a diverse range of significant scientists from all walks of life. We learn about the work of many famous scientists such as Ada Lovelace, Alan Turing, Isaac Newton and Marie Curie and how their discoveries have helped to shape the world we live in today. We also celebrate scientists in our 'Little People, Big dreams' assemblies where the children get to learn more about the scientists as people, their backgrounds and their passions. In addition to this, it is really important to us that we draw on the wealth of scientific knowledge and opportunities in our community. We do this by working in partnership with parents in the industry and make links with provision that can benefit the children in our school. We have worked with STEM ambassadors from Rolls-Royce who have helped us to challenge gender stereotypes and raise the aspirations of our children who are passionate about a future in STEM. In our science lessons, a variety of texts from a broad range of authors and scientists are used to ensure that the children hear theories, ideas and hypothesis from different perspectives to help to inform their decision making and shape their ways of thinking.





Supporting children with SEND:

To overcome any potential barriers in Science, we offer a range of supports and scaffolds for children with SEND, including:

- Mastery slides which provide children with the opportunity to recall previous learning before ensuring small step learning for new knowledge.
- Planning that supports individual needs including scaffolding to support them in achieving the lesson objective.
- Time for sensory exploration of materials, images and physical resources/textures through working scientifically skills.
- Investigation stations in continuous provision to enhance and develop learning within the setting (EFYS and YR 1)
- Encouragement through questioning to be creative and experiment with materials
- Visual pictures/images to support their learning of Science and working scientifically and help to expand their vocabulary knowledge
- Specialist equipment, for example; looped scissors, rulers with grips, pencil grips, sellotape holders.
- Opportunity to record their learning on Seesaw if they are unable to access the more formalised learning
- Support from peers and adults- talk partners and mixed ability grouping.



Examples of our Science curriculum

Early Years

Carry out a fair test.



Observing over time
– growing and
changing



Observing life
cycles





Examples of our Science curriculum

KS1

Classifying Materials



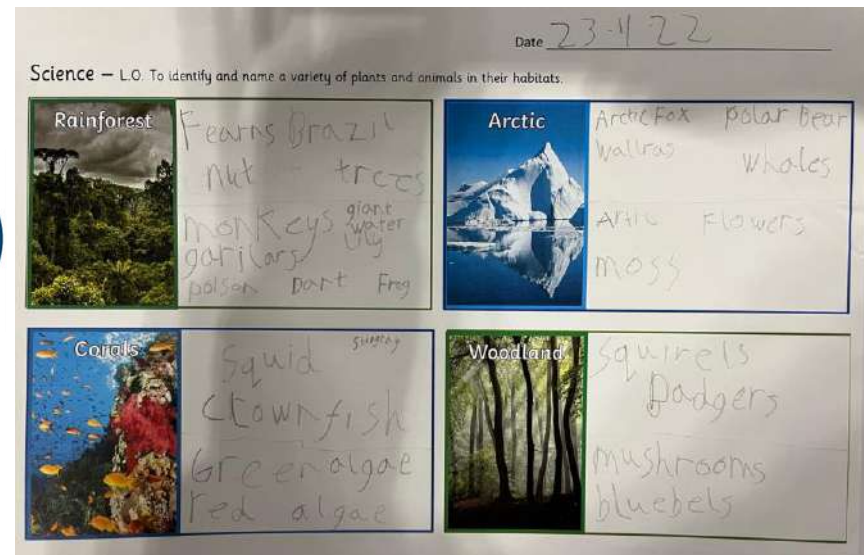
Creating a solar system



Demonstrating the solar system



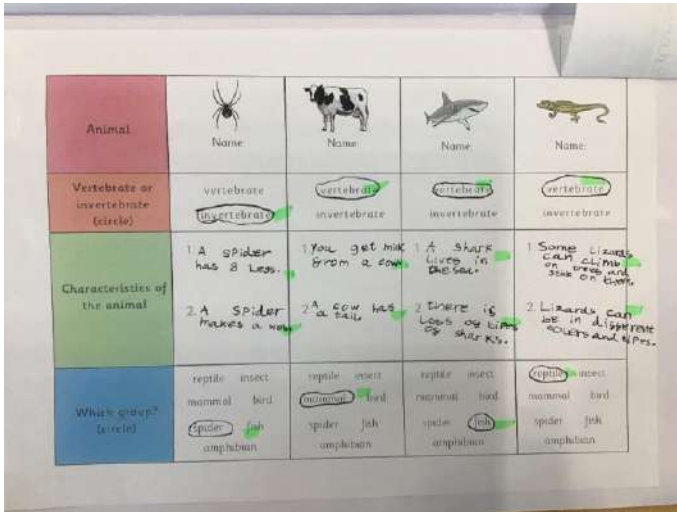
Researching animal habitats



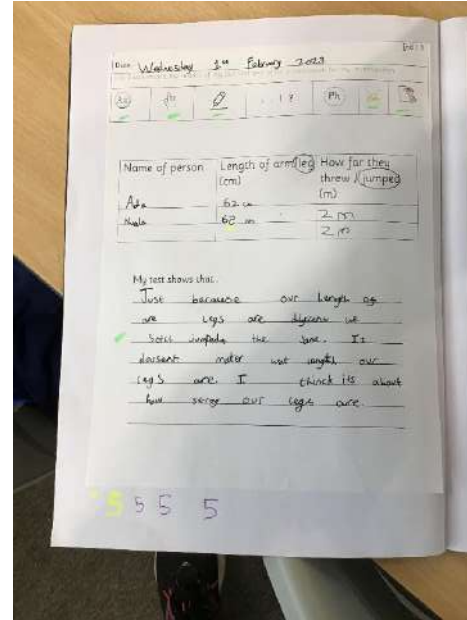


Examples of our Science curriculum

KS2



Classifying and observing animals.



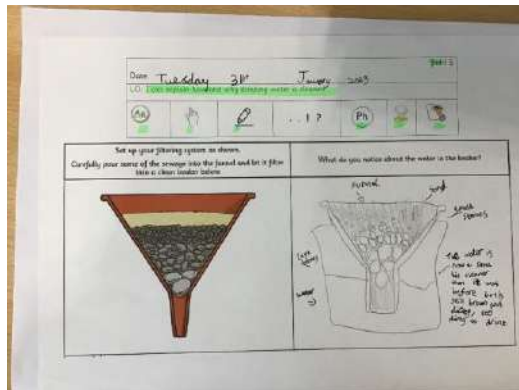
Performing experiments and planning fair tests.



Observing and identifying rock types.



Researching the skeleton
and what our bodies need
in order to be healthy.





Examples of Physical Literacy in our Science curriculum

Testing our senses whilst blindfolded



Lighting fires at Forest Schools



Exploring plants through multi-sensory experiences



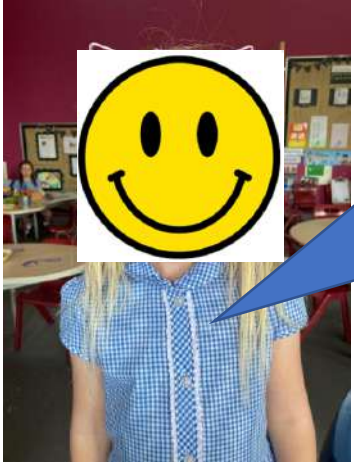
Experimenting!

Physically demonstrating the solar system





What do our pupils say?



L, Reception "I liked it when the Hilton children older than us came and made rainbows grow with us"



R, Reception "I love science in forest schools, we planted some seeds outside!"



M, Year 1 "I love using the magnifying glasses to see things closer up like the patterns on leaves and stones".

A, Year 2 "I love science when we learn new things about animals. We learned about how some animals offspring don't look like their parents. "



A, Year 2 "I like it when we get to predict what will happen. We learned about things that sink and float. I liked guessing and putting them into the water."



A, Reception "A scientist is someone who knows clever things, they do experiments... I like doing experiments!"



J, Year 1 "Science is cool when we do it all together. We made a volcano explode with vinegar and soda!"



P, Year 1 "I love measuring and comparing things in science, we grew and measured runner beans"

How could I support my child at

Encourage Observation

Observation is one of the most important steps in the scientific process. Have your child notice things in his or her environment and share your observations, too. For example: the way raindrops make waves in a puddle, how the wind makes a tree sway or new flowers blooming.

Encourage STEM Language

Try to integrate STEM language into everyday life. For example, when you're watching a film, ask your child, "What do you predict will happen next?" Ask your child to describe what he or she sees, feels, or hears, for example, when a child sees a rock or leaf outside, ask him to describe the colour, shape, size, or texture. Ask your child to describe what she is doing or what she did, this helps children to think about the processes and outcomes of events and experiences. For example, When your child is building with blocks, ask her to describe what she is building, what materials she is using, and how she is using the materials.

Encourage Questions and Model Curiosity

Children are naturally curious. Support their curiosity by asking them "what" questions instead of "why" questions. "Why" questions suggest there is a right answer, which can make young children hesitant because they don't know the answer. "What" questions help build confidence and communication skills as you give them questions they can answer. For example, If you ask, "Why does the paper clip stick to the magnet?" the child may not know the answer. Instead, ask, "What happens to the paper clip when it is near the magnet?" This is a question a child can answer with confidence.





Useful websites and Apps:



KS1 Science for Kids- Tappity (App)



Immerse AR in Education (App)



Professor Astros Cat's Solar System (App)



Max and Ruby's Science Educational Games (App)



Science Practical Simulator (App)



The Human Body by Tinybop (App)



Plants by Tinybop (App)

www.nasa.gov/kidsclub/index.html NASA Kids Club

www.nasa.gov/stem/forstudents/9-12/index.html NASA STEM for Students

kids.nationalgeographic.com/ Kids National Geographic

www.projectnoah.org/ Project Noah

billnye.com/ Bill Nye the Science Guy

www.pbs.org/wgbh/nova/labs/ Nova

www.youtube.com/channel/UCZYTClx2T1of7BRZ86-8fow SciShow

science.howstuffworks.com/ How Stuff Works

www.noaa.gov/education/resource-collections NOAA Resource

Collections